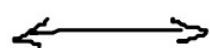


3.1 Linear Equations and Arithmetic Sequences p. 114



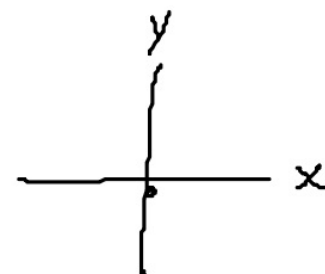
+ -

linear equation = equation of a straight line

$$y = ax + b \quad y = mx + b$$

$$a = m = \text{slope}$$

$$b = \text{intercept} \quad (0, b)$$



$$U_0 = 2.27$$

$$U_n = U_{n-1} + 1.37$$

where $n \geq 1$

$$n = 0 \quad (n, U_n)$$

$$(0, U_0)$$



slope = common difference

$$\frac{\text{rise}}{\text{run}} = \frac{3.64 - 2.27}{1 - 0} = \frac{1.37}{1} = 1.37$$

$$\text{slope} = 1.37$$

Ex A $U_0 = 2$

$$U_n = U_{n-1} + 6$$

where $n \geq 1$

explicit formula: $U_n = U_0 + d \cdot n$

$$U_n = 2 + 6n$$

$$U_{22} = 2 + 6(22) = 134$$

$$U_{100} = 2 + 6(100) = 602$$

$$\frac{U_{100} - U_{22}}{100 - 22} = \frac{602 - 134}{100 - 22} = \frac{468}{78} = 6$$

$$y = 2 + 6x$$

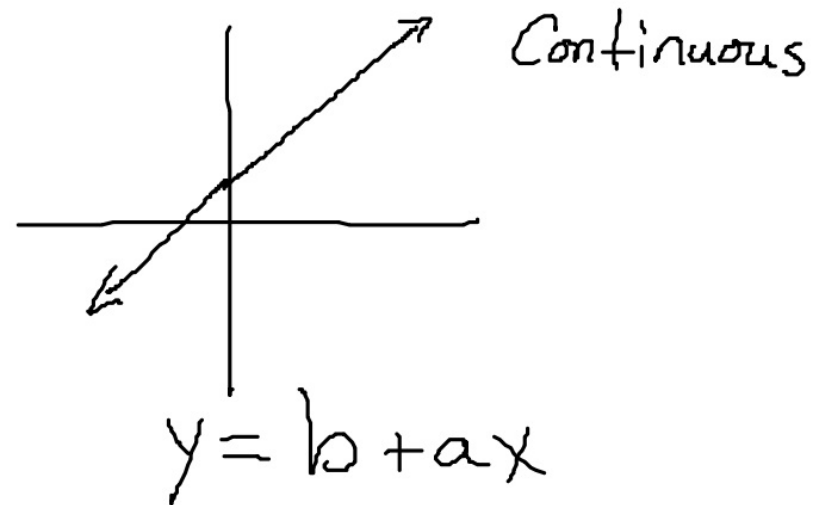
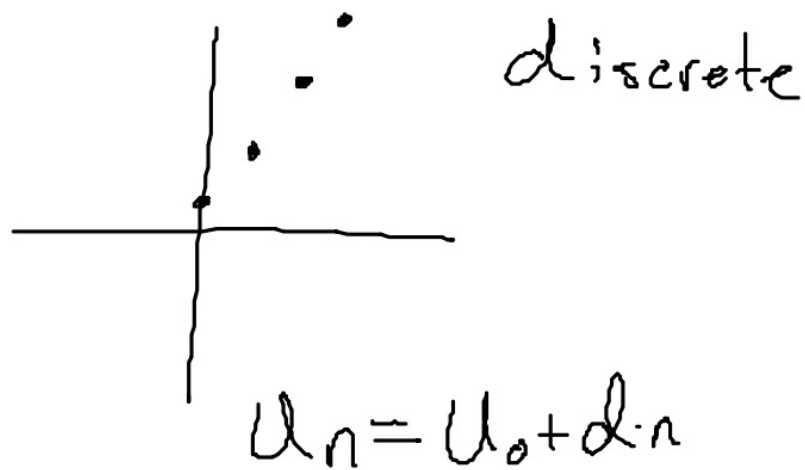
$$U_n = \frac{86}{6} = \frac{2 + 6n}{6}$$

$$14\frac{2}{6} = \frac{2}{6} + n$$

$$- \frac{2}{6} \quad - \frac{2}{6} \quad n = 14$$

y-intercept = U_0

Slope = Common difference



Investigate

1. B $y = 4 - x$

2. C iii

3. i

it should start at -4 and
will go up 3 by 3 each
time in the y-interception.

Ex B.

\$2 per day

\$17 left after lunch

$$u_1 = 17$$

$$u_n = 17 - 2n$$

$$u_n = u_{n-1} - 2$$

$$y = 17 - 2x$$

where $n > 1$

pp. 117-118 #1-6

3.2 Revisiting Slope p.121

4/8

$$\text{Slope} \quad \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

5pm 45,623 mi

9pm 45,831 mi

$$\frac{45831 - 45623}{9 - 5} = \frac{208}{4} \frac{\text{mi}}{\text{h}}$$

$$\frac{208}{4} = 52 \frac{\text{mi}}{\text{h}}$$

Slope-intercept form

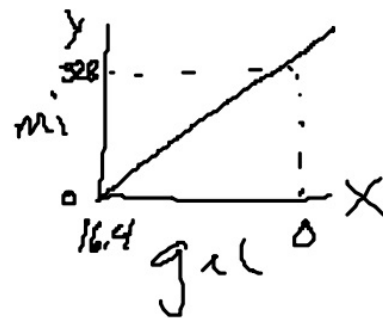
$$y = ax + b$$

$a = \text{slope}$

$b = y\text{-intercept}$

$$20 \frac{\text{mi}}{\text{gal}} \quad 16.4 \text{ gal (full)}$$

distance (mi) \swarrow dependent Y
 volume (gal) \nwarrow independent X



$$y = ax + b$$

$$20 \frac{\text{mi}}{\text{gal}}$$

$$0 \leq X \leq 16.4$$

$$y = 20x \quad 16.4x$$

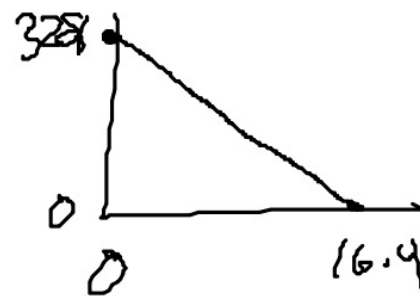
$$\frac{1}{20} \frac{\text{gal}}{\text{mi}}$$

$$0 \leq y \leq 328$$

$$y = -0.05x + 16.4$$

$$\frac{4}{11} \quad y = -0.05(175) + 16.4$$

$$y = 7.65 \text{ gal}$$



$$d) 2 = 16.4 - 0.05x$$

$$\begin{array}{r} -40 = -328 + x \\ +328 \quad +328 \end{array}$$

$$x = 288 \text{ mi}$$

domain - all possible x values

$$0 \leq x \leq 328 \text{ mi}$$

range - all possible y values

$$0 \leq y \leq 16.4 \text{ gal}$$

$0 \leq x$ ← all positive numbers

$x < 0$ ← all negative numbers

all real numbers

p. 124
#1-5

$$\frac{y_2 - y_1}{x_2 - x_1}$$

slope